Edwards Air Force Base
Environmental Restoration Program

Site 285 Update

September 2003

The selective ion exchange technology at Site 285 began treating perchlorate-contaminated groundwater at the site in March. Since then, nearly 3 million gallons of water have passed through the system, which reduces perchlorate to nondetectable levels.

Background of perchlorate at Edwards

The Air Force spent years in solid-fuel propellant development and rocket testing. This testing resulted in perchlorate contamination at Edwards. In addition to the plume at Site 285, perchlorate has been detected in groundwater at various other restoration sites on base.

All the perchlorate contamination at Edwards is found in shallow groundwater that already contains high levels of naturally occurring total dissolved solids. No drinking water aquifers are threatened.

The system will run long enough to evaluate the various aspects from treatment to regeneration to perchlorate destruction.

Capital costs were approximately $800,000 for installation of this site-specific treatment compound and components.

Treatment system overview

The selective ion exchange resin used in the treatability study works like a magnet. The magnet attracts or pulls out the perchlorate. When there's no more room on the surface of the magnet it needs to be cleaned.

Resin adsorption — the process of the magnet pulling out a contaminant — uses bead-like synthetic polymers that are insoluble but porous. These resin beads look like hard plastic balls about the size of a pinhead.The waste stream flows through the resin beds and the contaminant adsorbs onto the beads.

When a resin bed becomes saturated with perchlorate it must be regenerated. This is where perchlorate that attached to the surface of the resin beads is washed off to make the resin ready for reuse. The washing process uses a chemical solution to displace the perchlorate ions that are stuck to the exchange resin. This solution will be stored on site with appropriate safety precautions. It could also be reused. EM is currently pursuing a perchlorate destruction technology that would break down the perchlorate into the harmless byproducts of chloride and water.

These four red vessels contain the resin that adsorbs the perchlorate from the contaminated groundwater during treatment.

Perchlorate treatment system facts and figures

- Intermittent treatment began in March 2003
- Continuous treatment began in May 2003
- 2.8 million gallons of groundwater treated
- Influent perchlorate concentration is 300 parts per billion
- Perchlorate continues to be removed to nondetectable levels
- 8 pounds of perchlorate removed
- Flowrate is 35 gallons per minute
- Regeneration of first resin vessel anticipated in November 2003
- Destruction of perchlorate from first regenerant solution batch anticipated in January 2004

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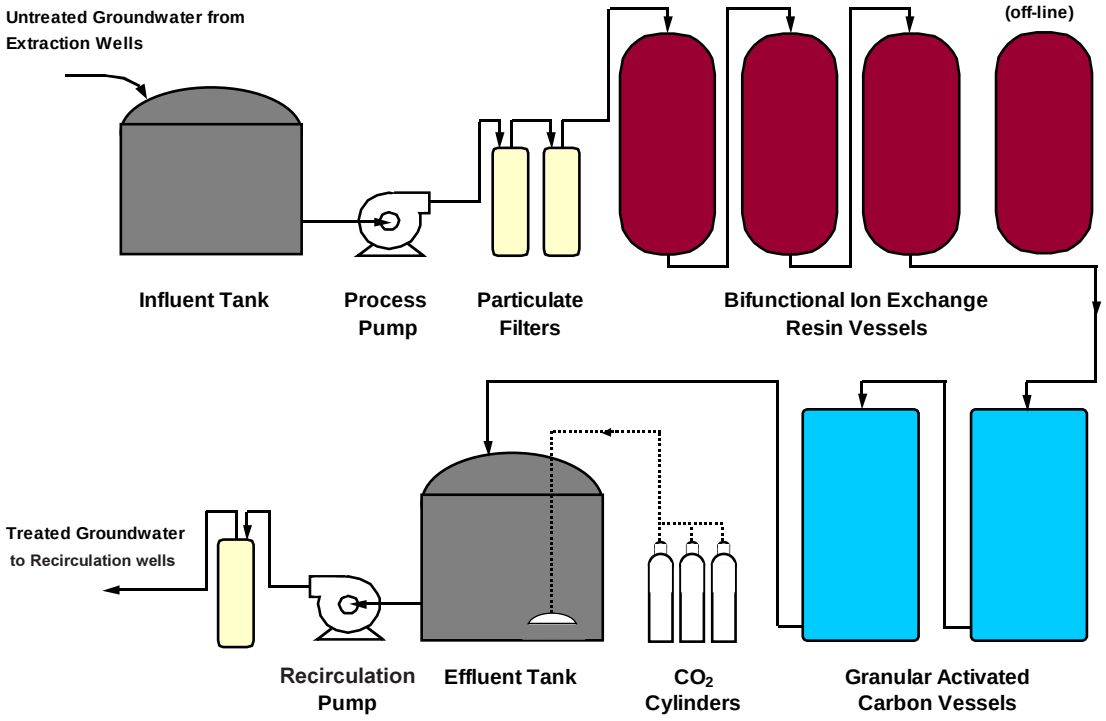
The diagram to the left shows the overlay of the Site 285 treatment system, piping, and wells with the groundwater perchlorate plume and site features. The blue line represents the predicted groundwater capture zone - which is created by the groundwater extraction and recirculation layout. Recirculating water back into the ground helps push the contaminated water to the extraction wells.

Process Flow Diagram
Site 285 Groundwater Extraction and Treatment System



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